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10/540,965	08/25/2005	Takuji Higashioji	TOR-05-1179	6051

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EXAMINER

NELSON, MICHAEL B

ART UNIT	PAPER NUMBER
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1794

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/540,965	Applicant(s) HIGASHIOJI ET AL.	
	Examiner MICHAEL B. NELSON	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6,8,10-14 and 29-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6,8,10-14 and 29-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/23/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendments filed on 02/27/09 have been entered. Claims 1, 2, 6, 8, 10-14 and 28-39 are currently under examination on the merits. An English language equivalent to the Takashi reference used in the previous rejection will be use in the current rejection in lieu of a human translation.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-27, 37 and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites vague and indefinite limitations related to the network structure. Firstly, it is not clear what is meant to be considered a "linear element." Secondly, it is unclear how the linear elements contain both the liquid crystal polyester and the non-liquid crystal polyester since the elements depicted in applicant's figure 1 are the result of the separation between these two materials and would therefore only contain elements of the liquid crystal polyester or the non-liquid crystal polyester, not both. Claim 39 also contains vague language. It is unclear how the language: "of 95:5 -50:50 ratio," is meant to describe the components being mixed into the chips. It is advised to more clearly specify which component is part of which ratio. Also it is unclear what subsequent process the limitation "beforehand" is describing.

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1, 2, 8, 10-14, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takashi (JP 10-0245542), see English language equivalent Hibiya et al. (U.S. 6,136,420), with evidentiary support from Perez et al. (U.S. 6,331,343).

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Regarding claims 1 and 28, Hibiya et al. discloses a laminated film comprising a coextruded B/A/B layered structure (C15, L35-50) with layers B being biaxially stretched but non-porous polyester (C4, L35-45, C6, L5-35) and layer A being a biaxially stretched, porous layer (C4, L25-35) of polyester and an immiscible polymer (i.e. liquid crystal polyester, C5, L5-15). The liquid crystal polyester immiscible polymer is disclosed as being present at 5-45% (See Abstract) which leaves 95-55% non-liquid crystal polyester (i.e. the polyethylene terephthalate as disclosed in Example 1, C20, L25-60), which falls within the claimed range. The process of stretching the film is disclosed as causing the cells (See Abstract). In one example the relative thickness of the layers are disclosed as B/A/B=20/40/20 (i.e. 50% porous layer), which falls within the claimed range (Table 4, C26). The fine cells of the A layer are a network structure.

Hibiya et al. does not specifically disclose the instant claimed specific gravity, however, one of ordinary skill in the art would adjust the amount of bubbles (i.e. amount of void space and therefore specific gravity) in the network containing layer, through routine experimentation, in order to optimize the mechanical strength (among other properties) of the overall laminate.

Regarding the connected linear elements limitations, the immiscible polymer separation process of Hibiya et al., especially at higher concentrations of immiscible polymer (i.e. 45%) would produce a structure having heterogeneous zones (i.e. cells) of continuous phase polymer and discrete phase polymer (i.e. immiscible polymer). The stretched cells, or the continuous phase polymers which run between them, would be of a substantially linear shape and would be interconnected. See, as evidentiary support of this fact, Perez et al., which is directed to a similar immiscible polymer blend which is stretched to create voids (i.e. cells) (See Abstract). Perez et

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al. affirms that in this process, the voids "lack distinct boundaries" and are therefore interconnected (C6, L20-25).

Regarding claims 2, 8, 10-14 and 29, Hibiya et al. discloses all of the limitations as set forth above. Additionally, Hibiya et al. discloses that the non-fine bubble layers are on both sides of the bubble layer. The liquid crystal polyester immiscible polymer is disclosed as being present at 5-45% (See Abstract). In one example the relative thickness of the layers are disclosed as B/A/B=20/40/20 (i.e. 50% porous layer), which falls within the claimed range (Table 4, C26). Non-liquid crystal polyester (i.e. the polyethylene terephthalate as disclosed in Example 1, C20, L25-60) is disclosed in both A and B layers.

Regarding the various physical properties of claims 12-14, the amount of void space (i.e. the amount of bubbles) is a variable that one having ordinary skill in the art would have found obvious to modify, through routine experimentation, to optimize the mechanical strength, thermal insulation and thermal expansion characteristics of the overall laminate.

8. Claims 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takashi (JP 10-0245542), see English language equivalent Hibiya et al. (U.S. 6,136,420), with evidentiary support from Perez et al. (U.S. 6,331,343) as applied to claim 1 above, and further in view of Nakatani et al. (2001/0003610).

Regarding claims 30-32, Hibiya et al. discloses all of the limitations as set forth above. Hibiya et al. does not explicitly disclose electronic circuitry as an commercial application.

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Nakatani et al. discloses a void containing, insulating, base material with tackfree (i.e. release films) on both sides thereof for use with electronic circuits (See Abstract).

The inventions of both modified Hibiya et al. and Nakatani et al. are drawn to the field of void containing laminates and therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have used the void containing laminate of modified Hibiya et al. as a tack-free electrically insulating circuit material as taught by Nakatani et al. for the purposes of imparting improved marketability to the invention.

9. Claims 6 and 33-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takashi (JP 10-0245542 see English language equivalent Hibiya et al. (U.S. 6,136,420), with evidentiary support from Perez et al. (U.S. 6,331,343) as applied to claim 1 above, and further in view of Nakamura et al. (U.S. 5,830,940).

Regarding claims 6 and 33-36, Hibiya et al. discloses all of the limitations as set forth above. Hibiya et al. only discloses a general liquid crystal polyester ([0017]) for use with the non-liquid crystal polyester ([0009]). Nakamura et al. discloses a liquid crystal polyester which was known to be made by copolymerizing polyethylene terephthalate with p-hydroxybenzoic acid (C1, L20-50) and which exhibits superior flowability, thermal resistance and mechanical properties.

The inventions of both Hibiya et al. and Nakamura et al. are drawn to the field of liquid crystal polyesters and therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the non-specific liquid crystal polyester of Hibiya et

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al. by using the specific example of a liquid crystal polyester as taught by Nakamura et al. for the purposes of imparting superior flowability, thermal resistance and mechanical properties.

Given the beneficial properties of the liquid crystal polyester of Nakamura et al., it would have been obvious to one having ordinary skill in the art to have adjusted the relative amount of liquid crystal polyester to greater than the 45% disclosed in Hibiya et al. (i.e. including amounts greater than 50% as instantly claimed) in order to impart a higher degree of the beneficial properties mentioned in Nakamura et al. to the final product of Hibiya et al.

Regarding claim 39, Hibiya et al. discloses all of the limitations as set forth above. Additionally, Hibiya et al. discloses that reclaimed scrap chips of previous runs of production could be recycled back into the production line to contribute to at least part of the cell containing layer composition (C6, L40-C7, L25 and Comparative Example 2, C21, L10-25). The reclaimed chips being used from previous examples would contain the continuous and discrete phase polymers at the relative amounts disclosed in Hibiya et al., which read on the instant claimed ranges.

Response to Arguments

10. Applicant's arguments filed on 02/27/09 are considered moot in light of the new grounds of rejection which were necessitated by applicant's amendments. Arguments which are still deemed to be relevant are addressed below.

11. Regarding applicant's arguments related the linear, connected network limitation, as discussed above in the rejections, the limitation would be inherently present, at least to some degree, in the void containing films formed via immiscible polymer separation through stretching.

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12. Regarding applicant's arguments that Takashi (Hibiya et al.) does not disclose liquid crystal polyester, the examiner notes that disclosure of this class of compounds as being immiscible polymers is present in both the original and English language equivalent prior art documents (C5, L5-15 for Hibiya et al. and [0009] and [0017] for the original machine translation of the Takashi document).

13. Regarding the new range of 50-90% in the new claims, as explained above it would have been obvious to have increased the amount of liquid crystal polyester to within these ranges to increase the amount of liquid crystal polyester properties present in the final film. While Hibiya et al. discloses that more than 45% immiscible polymer would result in deleterious properties owing from a higher concentration of voids (i.e. too many voids can cause undue surface roughness) (C5, L35-55), one having ordinary skill in the art would realize that the "immiscible polymer" mentioned in Hibiya et al. as causing this effect is actually the discrete phase (i.e. the polymer present at less than 50%). Hence, since the liquid crystal polyester and the non-liquid crystal polyester are both mentioned as being immiscible with respect to one another, Hibiya et al. is actually teaching away from either polymer being present at between 45 and 50% because it would result in too many voids and therefore an uneven surface. At ranges of above 55% above (i.e. less than 45% non-liquid polyester), the liquid crystal polymer would be present as the continuous phase polymer and the non-liquid crystal polymer would be present as the immiscible polymer (i.e. discrete phase polymer). The resulting film would contain an amount of voids which would not result in the undesirable surface roughness (i.e. less than 45% discrete phase). It is also noted that the surface roughness would be mitigated by the smooth "A" layers

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which are coextruded with the porous layer specifically for the purposes of preventing surface roughness in the final film.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL B. NELSON whose telephone number is (571) 270-3877. The examiner can normally be reached on Monday through Thursday 6AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/
Supervisory Patent Examiner, Art Unit 1794

/MN/
04/21/09